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(Article begins on next page)

Temporal Changes in Sources and Elemental Composition of Airborne Particulate Matter Sampled in Turin, Italy

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Abstract

The temporal trends of major, minor and trace elements present in airborne particulate matter sampled at different monitoring stations in the city of Turin (Piedmont, Italy) were determined for the period from 1976 to 2005. The application of chemometric methods (Principal Component Analysis and Hierarchical Cluster Analysis) to the experimental results allowed us to identify correlations among the investigated elements and reveal similarities and differences between sampling sites, highlighting the existence of different sources of pollution during the 1970's and 80's as opposed to those present in more recent years. The applicability, advantages and disadvantages of different analytical techniques, namely X-Ray Fluorescence (XRF) and Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-AES) for the analysis of airborne particulate matter are discussed.